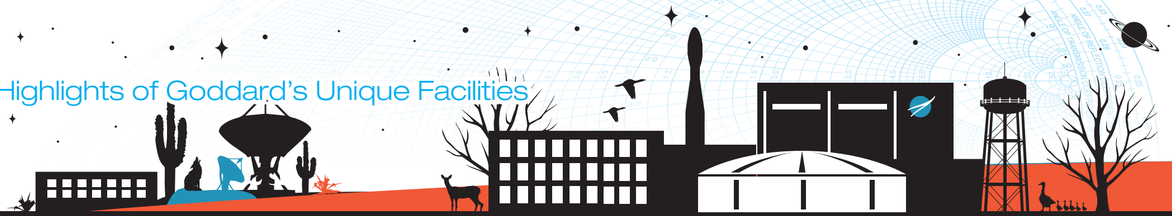
Highlights of Goddard's Unique Facilities



GODDARD MISSION SERVICES EVOLUTION CENTER

The Goddard Mission Services Evolution Center (GMSEC) is a software framework that allows existing satellite control software products to be easily integrated to create sophisticated mission control centers. The GMSEC approach includes the use of middleware, standardized message formats, and cross-platform plug and play mission support applications.

WHITE SANDS COMPLEX GROUND TERMINALS

The Space Network ground segment at the White Sands Complex consists of satellite ground terminals: the Second TDRSS Ground Terminal and White Sands Ground Terminal, plus the remotely operated Guam Remote Ground Terminal and Blossom Point Ground Terminal. These terminals enable nonstop, real-time satellite communications, data relay, and tracking services for spacecraft, launch vehicles, and science missions.

SPACE TELESCOPE OPERATIONS CONTROL CENTER

The Space Telescope Operations Control Center (STOCC) manages the control, flight, and health of the Hubble Space Telescope. Hubble has made more than a million observations since its launch in 1990, and its record-breaking orbit encompassing millions of miles is made possible by the efforts of engineers, technicians, and controllers at this focal point of all Hubble operations.

WALLOPS LAUNCH RANGE

This only NASA-owned launch range consists of a control center, multiple orbital and suborbital launch pads, processing and assembly facilities, and numerous tracking assets. Mobile assets are often deployed at downrange sites and around the world to support science missions wherever required.

SPACE SYSTEMS DEVELOPMENT AND INTEGRATION FACILITY

The Space Systems Development and Integration Facility (SSDIF) is an 86,000-square-foot building used to integrate and test space hardware. It houses the 1.3 million-cubic-foot High Bay Clean Room, the largest of its kind in the world. The SSDIF currently supports James Webb Space Telescope integration and test activities.

INTEGRATED DESIGN CENTER & MISSION PLANNING LAB

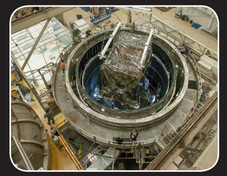
These facilities are unique resources for concurrent engineering where engineers and scientists use a collaborative process and sophisticated tools to rapidly produce mission, science instrument, and mission-enabling technology concepts. Services provided include end-to-end design and analysis, visualization, realistic mission simulation, evaluation of platform selection, and flight profiles, among others. The Integrated Design Center includes Architecture, Mission, and Instrument Design Labs. The Mission Planning Lab also provides launch-range specific analysis.

DETECTOR DEVELOPMENT AND CHARACTERIZATION LABORATORIES

Built within a 4,800-square-foot Class 10/100 cleanroom, the Detector Development Laboratory (DDL) is a microelectronics fabrication facility dedicated to the development of advanced detectors, micro-electrical-mechanical-systems, nanotechnology, circuits, and components for NASA missions with the capability of full-scale custom wafer fabrication. The Detector Characterization Laboratory (DCL) is an advanced facility for complete optical and electrical characterization of custom detectors.

INTEGRATION AND TEST COMPLEX

This suite of Integration and Test facilities provides the capability to simulate the critical environmental conditions generated by ground handling, launch, and orbital flight for science missions. It supports testing of acoustic and vibration spectrum and intensity, rotational acceleration, electromagnetic environment simulation and determination, temperature extremes, atmospheric pressure deprivation, and varying magnetic field levels. Key facilities include the Space Environment Simulator, a 40-foot by 27-foot thermal vacuum chamber which exposes spacecraft components and payloads to the environmental conditions experienced in space; the Acoustic Test Chamber, a 42-foot tall chamber which exposes payloads to the noise of a launch with the help of 6-foot tall speakers; and the High-Capacity Centrifuge, a 120-foot diameter centrifuge which simulates the increased feeling of gravity's pull during launch.



FLIGHT DYNAMICS FACILITY

The Flight Dynamics Facility (FDF) assists satellites, expendable launch vehicles, and crewed spacecraft to ensure that the craft is travelling in the correct direction. The FDF calculates the trajectory based on measurements from space- or ground-based antennas and provides information to redirect these antennas to establish the link for tracking and communications. During a mission, FDF engineers ensure that the vehicle can communicate with the mission control centers.

NASA CENTER FOR CLIMATE SIMULATION

This facility provides state-of-the-art supercomputing and data services for weather and climate research with worldwide access. It also provides data analysis and visualization tools to interpret modeling data, including the Data Exploration Theater. This theater features a 20-foot by 6-foot 10-inch multi-screen visualization "hyperwall," a joint effort of the center and the Scientific Visualization Studio.

SCIENTIFIC VISUALIZATION STUDIO

The Scientific Visualization Studio (SVS) fosters scientific inquiry and outreach within NASA programs through animations and artistic concepts based on science data. The studio works closely with scientists to promote a greater understanding of Earth and space science and provides these visualizations for free to the general public via the Goddard web site.

WALLOPS PAYLOAD AND VEHICLE INTEGRATION FACILITIES

The Suborbital Programs (sounding rockets, balloons, and aircraft) organization manages unique facilities that enable worldwide science. They include vehicle and payload processing facilities as well as specialized launch systems.

WALLOPS RESEARCH AIRFIELD

This airfield provides immediate access to restricted airspace, consists of three runways providing support to NASA's Earth science missions and Wallops Launch Range, and serves as a test site for aircraft research.